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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/530,049

09/21/2005

Rainer Hainberger

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EXAMINER

HUGHES, DEANDRA M

ART UNIT

PAPER NUMBER

3663

MAIL DATE

DELIVERY MODE

07/26/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/530,049

Applicant(s)

HAINBERGER ET AL.

Examiner

Deandra M. Hughes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2007.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 15 is/are pending in the application.
4a) Of the above claim(s) 1 and 10-12 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 2-9, 13 and 15 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 05 April 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 4/20/07 have been fully considered but they are not persuasive.

Applicant argues, "the phrase 'relative timing offset' is replaced with the phrase 'relative timing' which covers not only an offset between the first and second order pumps, but also a modulation frequency, a duty cycle, etc." (pg. 6 of Remarks).

This argument is not persuasive because as has been highlighted below in the rejection reproduced from the non-final office action dated 1/5/07, the claim language regarding relative timing and duty cycles was addressed. Applicant has not distinguished the instant claim from the prior art rejection.

Drawings

2. The drawings were received on 4/5/07. These drawings are accepted.

Claim Rejections - 35 USC § 103

3. Claims 2, 5-9, 13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fludger (US 2003/0081307 filed Sep. 28, 2001) in view of Bolshtyansky (US 6,456,426 filed Aug. 7, 2001).

With regard to claims 2, 5-9, and 15, Fludger discloses an amplification system (fig. 1) employing Raman amplification with a plurality of first-order Raman pumps and at least one second-order Raman pump (paragraphs [0026] and [0027]) which amplifies the first-order Raman pumps the first- and second-order Raman pumps (a 1st order pump is inherently amplified by the 2nd order pump, this is why the 2nd order pump is the

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2nd order pump; in Raman amplifying fibers, a pump signal one Stokes shift away, i.e. approximately 100nm, pumps a signal) counter-propagating (the pumps in fig. 1 are counter-propagating) to signal light in an optical fiber, the amplification system comprising:

- a plurality of light sources generating pump light of the first- and second-order pumps (pumps #14, #16, #18, #20, and #22 are a plurality of light sources);
- wherein the pump light of the first- and second-order pumps are modulated by using relative timing of the first- and second-order pumps to allow flattening lateral signal power distribution along the optical fiber (fig. 5 and paragraphs [0046]-[0047]).

However, Fludger does not specifically disclose a modulator unit modulating the pumps. Bolshtyansky teaches a modulator unit (fig. 2, #38 and col. 8, lines 1-9) which controls **the relative timing** among the pump pulses (e.g. figs. 6-7) by electronically adjusting **duty cycle** (col. 7, line 67). Further, Bolshtyansky teaches the use of larger duty cycles when overlap of the pumps is acceptable (col. 8, lines 1-2). Also, Bolshtyanasky teaches that power transfer among the pumps are pushed deeper into the fiber by the modulation of the pumps (fig. 5 and col. 6, lines 32-47). It would have been obvious to one of ordinary skill in the art (e.g. an optical engineer) at the time the invention was made to modulate the pumps for the advantage of reducing the detrimental effects of cross-pump pumping, as is specifically taught by Bolshtyansky (col. 7, lines 10-15).

Claim 13 is merely the method of normal operations of the apparatus as claimed.

4. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fludger in view of Bolshtyansky as applied to claim 1 above, and further in view of Papernyi (Third-Order Cascaded Raman Amplification, OFC 2002).

Fludger in view of Bolshtyansky does not disclose third-order pumping. However, Papernyi teaches both counter and co-propagating third-order Raman pumping (figs. 3-4). It would have been obvious to one of ordinary skill in the art (e.g. an optical engineer) at the time the invention was made to third-order Raman pump the amplifier for the advantage of reduced noise and complexity, as is specifically taught by Papernyi (FB4-1, 1st paragraph).

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

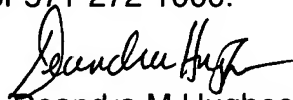
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deandra M. Hughes whose telephone number is 571-272-6982. The examiner can normally be reached on M-F, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Deandra M Hughes
Primary Examiner
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